**Task 1: Program Planning**

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D598: Analytics Programming

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**A.  Create a flowchart for a program to perform the required task.**

**A diagram of a company

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Flowchart structure adapted from Codecademy (n.d.).

**B.  Write pseudocode for a program to perform the required task.**

# Import data frame

# Check for duplicate rows

# Delete the duplicate rows

# Group the data by Business State

# Run descriptive statistics (min, max, mean, median) and assign the results to a new data frame

# Filter the original data frame to identify businesses with a negative debt-to-equity ratio and assign the results to a new data frame

# Calculate debt-to-income ratio for each business where the total revenue is not zero or missing

# Store the dti calculations in new data frame

# Concatenate the original data frame and the debt-to-income ratio data frame and store the results in a new data frame

**C.  Provide an explanation of the relationship between the flowchart and pseudocode that does the following:**

**1.  Describe the logic behind the flowchart and pseudocode.**

The flowchart represents a visual diagram that shows the flow of the code, step by step, without getting too detailed (Codecademy, n.d.). The high level flow of the code is that it starts, imports data, cleans the data by removing the duplicate rows, creates a new data frame that contains descriptive statistics, then it filters the dataset again based on whether or not the debt-to-equity ratio is negative, and then it calculates a new value and stores the result to a new data frame. Lastly, the code concatenates the original data frame and the new data frame with the new calculated value, and the code ends.

The pseudocode is similar to the flowchart in the sense that it shows the flow of the code, but a little bit more descriptive and its text rather than a visual diagram. Each step of the pseudocode is what the code will be doing, without getting too technical into the functions or methods that the code will actually be using. The pseudocode shows that the actual code will import the data frame, clean the data by checking for duplicate rows and removing them, group the data by state, then it will run descriptive statistics and assign the result to a new data frame. The code will then filter out businesses that don’t have a negative debt-to-equity ratio. Next, it will calculate a new value that represents the debt-to-income ratio for each business and store it in a new data frame. Lastly, the code will take the debt-to-income data frame and concatenate it with the original data frame.

**2.  Explain the alignment between flowchart and pseudocode.**

The flowchart and pseudocode both have the purpose of showing the process of the code on a higher level, without getting too technical. One method is more visual (flowchart) and the other is text-based (pseudocode). They both break down the code step by step, starting by importing the data, checking for duplicate rows, running descriptive stats, etc. This makes it easier to understand the actual code or to help write the code to perform the task by following the plan of the diagram or pseudocode.

  Here’s the breakdown of the alignment:

|  |  |
| --- | --- |
| Flowchart Step | Pseudocode Step |
| A diagram of a data frame  AI-generated content may be incorrect. | # Import data frame |
| A diagram of a diagram  AI-generated content may be incorrect. | # Check for duplicate rows |
| A close-up of a graph  AI-generated content may be incorrect. | # Group the data by Business State |
| A diagram of a process  AI-generated content may be incorrect. | # Run descriptive statistics (min, max, mean, median) and assign the results to a new data frame |
| A diagram of a graph  AI-generated content may be incorrect. | # Filter the original data frame to identify businesses with a negative debt-to-equity ratio and assign the results to a new data frame |
| A diagram of a graph  AI-generated content may be incorrect. | # Calculate debt-to-income ratio from the original data frame for each business and store it in a new data frame |
| A graph with a pink square with black text  AI-generated content may be incorrect. | # Concatenate the original data frame and the debt-to-income ratio data frame and store the results in a new data frame |

**References**

Codecademy. (n.d.). *What is Pseudocode and Flowcharts?* Codecademy.

https://www.codecademy.com/article/pseudocode-and-flowcharts